DETAILED ACTION

Claims 3 and 16-21 are pending.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 22 July 2009 has been entered.

Election/Restrictions

2. Claim 16 has been examined to the extent they read on the elected species. The remaining species in the claims 17 and 18 have been examined to the extent that they read on the elected species (i.e., when m = 0, and therefore n = 0 or is moot). Election was made **without** traverse in the reply filed on April 16, 2004 and acknowledged in the Office action mailed July 9, 2004.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claims 16-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Each of $R_{e\text{-}m}$, it is unclear what an amino acid is reacted to form said functional group. A similar situation exists and it is unclear what is intended for $R_{a1\text{-}a3}$, $R_{b1\text{-}b3}$, and $R_{g1\text{-}g3}$. The claims do not set forth what functional group is obtained, with what the amino acid is reacted, what type and/or class of reaction, and/or how said groups are linked to the core structures.

Furthermore and while applicants' specification presents specific examples and permutations of possible reaction products, said recitations do not set forth with adequate specificity the scope of the claims as presently claimed. Applicants set forth lysine esters of chromophores at page 36, and broadly disclose (pages 22-27) substituents as “derived essentially from”: defined as functional groups that closely relate to an amino acid (*i.e.*, a trivial modification of an amino acid). Example 34 (pages 53-54) exemplify lysine derivatization. Applicants further point to page 19 as providing a list of functional groups.

Said functional groups are not specifically defined. See modifier of alterative grouping, i.e., "such as", at page 19. The only example to a functional group formed by reaction with amino acid is esterification of a hydroxyl substituted core compound by lysine. The claims do not define a trivial modification of the amino acid or the substitution of possible functional groups as applicants’ directed attention at page 19 with the exception of amino groups and acid groups of the amino acids.

The metes and bounds of the claimed subject matter sought for a patent is unclear since the limitation: "a functional group obtained by reaction with an amino acid" lacks; (i) what the amino acid was to be reacted, (ii) what the functional group applicants

intend, (iii) what kind of reaction applicants intend, and/or (iv) how said amino acid reaction product is attached to the core structure. The lack of any combination of elements (i), (ii), (iii) and (iv) render the claims indefinite as to their metes and bounds.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al, "*Measurements of Two-Photon Absorption Cross Sections of Common Blue Dyes*", Optics Communications, Volume 63, Number 5, (01 Sept. 1987), pages 335-338, as evidenced by Joel M Kauffman, "*Laser Dye Structures and Synonyms*", Applied Optics, Vol. 19, No. 20 (15 October 1980), pages 3431-3435.

Chen et al (pages 335-338, particularly Table 1) disclose measuring the two-photon absorption cross sections of common blue dyes, which include BBQ dye.

Kauffman (page 3432, Dye No. 1) discloses the structure of BBQ dye and its available from Exciton Chemical Co. (footnote *b*, page 3434). Kauffman is cited herein merely to show the BBQ dye structure employed in the Chen et al reference.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

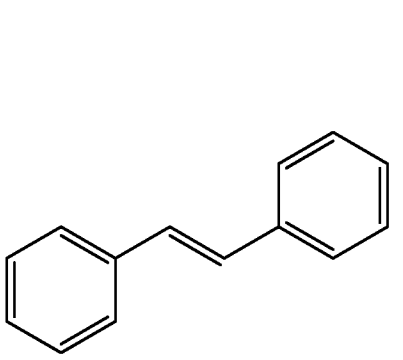
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

> the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

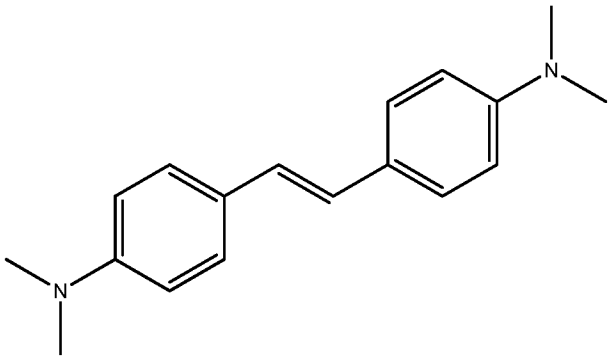
8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ershov et al, “Kinetics of photochemical transformations of 1,2-diaryl derivatives of ethylene and functional derivatives of stilbene in poly(vinyl chloride)”, Khimiya Vysokikh Energii (1973), 7(4), 368-369, as evidenced by CA abstract (CAPLUS) AN 1974:15388, in view of Swainson et al, US 4,333,165, Miyazawa et al., "*Selective Isomerization of cis-Stilbene by Non-Resonant Two-Photon Excitation*", Chemistry Letters, Vol. 24, No. 3, (03-1995), pages 217-218; and Abe et al, US 5,196,250.

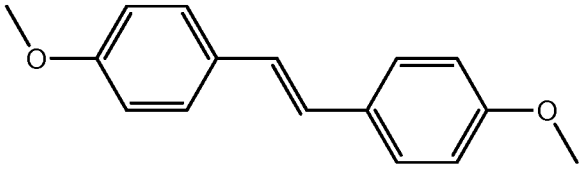
Ershov et al discloses Kinetics of photochemical transformations as irradiation-initiated cis-trans isomerization of 1,2-diaryl derivatives of functional derivatives of stilbene in poly(vinyl chloride). Ershov et al discloses a number of stilbene derivatives, which 1,2-diphenylethylene (common name stilbene) and 4,4'-bis(dimethylamino)stilbene (stilbene derivative) are examples having the following structures.



1,2-diphenylethylene



4,4'-bis(dimethylamino)stilbene



4,4'-dimethoxystilbene

The Ershov et al reference differs from the claims in a single-photon irradiation-initiated cis-trans isomerization rather than a two-photon irradiation-initiated cis-trans isomerization.

The Swainson et al reference (column 11, lines 45 et seq and columns 13 to 14, lines 362 to 16, particularly line 4) is directed to three dimensional patterned media wherein simultaneous two-photon absorption systems may be employed including polymers incorporating stilbenes. Swainson et al (column 14, lines 5-16) teaches polymers, which the light sensitive group is incorporated include certain alkene polymers with sensitizing halogen compounds.

Miyazawa et al discloses two-photon isomerization of stilbene compounds.

Abe et al discloses optical information recording medium comprising polymers incorporation stilbene (diphenylethylene, *i.e.*, diphenylpolyene, wherein n = 1) and or diphenylpolyenes.

These references are combinable because they teach stilbene compounds, optical properties of said stilbene compounds, and uses in optical applications of said stilbene compounds. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to employ the stilbene derivatives such as those disclosed in the Ershov et al reference for the stilbenes incorporated into polymers taught in the Swainson et al reference and use the resulting combination in a two-photon recording process as taught for the related compositions in the Abe et al and Miyazawa et al references. Miyazawa et al provides reasonable expectation of success of the stilbene compounds in a two-photon reaction.

One having ordinary skilled in the art would have reasonably expected the stilbene derivatives of the Ershov et al reference to function in a two-photon process as the stilbenes and/or recording media taught in Swainson et al for the recognized the advantages of the substitution therein since:

(1) Ershov et al teaches the analogous optical properties in one-photon cis-trans isomerization processes for the unsubstituted and substituted stilbenes.

(2) Miyazawa et al discloses two-photon cis-trans isomerization of unsubstituted stilbenes.

The ordinary skilled artisan would have expected the substituted stilbene derivatives of the Ershov et al to function similar in a two-photon process to the unsubstituted stilbenes as recognized by the Miyazawa et al reference.

Furthermore, (3) Swainson et al (column 12, lines 20-31) further teaches ring closure of spiropyrans like the cis form of the stilbenes taught in the Miyazawa et al

reference. Swainson et al allows for voxel components in three dimensional materials comprising polymers incorporating stilbenes as photosensitive polymers for a two-photon process and the prior art recognizes in the (4) Abe et al reference (Table 2), the incorporation of stilbenes and related compounds into polymers for recording.

Allowable Subject Matter

10. Claim 3 is allowed.

Response to Arguments

11. Applicant's arguments with respect to claims 16-19 have been considered but are moot in view of the new ground(s) of rejection.

12. Applicant's arguments filed 22 July 2009 have been fully considered but they are not persuasive.

13. Applicants (pages 14 and 15) assert the claims are clear as set forth and provide a declaration under 37 CFR 1.132 by Nils Kröger regarding said issue of definiteness. The declaration is unsigned and thus, it is not probative. The declaration is an opinion declaration of one asserted to be of skill in the chemical arts.

14.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (571) 272-1089. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David W. Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel S. Metzmaier/
Primary Examiner, Art Unit 1796

DSM